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# Livestock Feeds and the Feed Supply

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**Sample records:**  
See Chapter 11.

Sound feeding and management practices are an integral part of raising wholesome meat and milk products for consumers. Cattle should be provided a clean, readily accessible source of water from tanks or watering devices free from bacterial or nutrient contaminants. Producers should feed nutritionally balanced diets composed of quality forages and feedstuffs harvested and stored to prevent contamination. To prevent contamination of the meat and milk produced, no harmful residues should be allowed to enter the feed supply when cattle are fed.



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**Birds and rodents not only consume feed but can spread disease by contaminating feed with their droppings.**



## Purchased Feeds

- Federal law prohibits the use of ruminant-derived animal protein in any feed fed to cattle (ruminants). At press time, an expanded version of this feed rule is under review. The producer is responsible for knowing and complying with regulations as they are amended.
- Several medicated feeds and feed additives are approved for use in cattle. However, medicated feeds must be used according to the label directions, and withdrawal times must be followed.
- Extra-label use of medicated feeds or feed additives by nutritionists or veterinarians is illegal and prohibited.
- Feeds (grain mixes as well as commodities) should be purchased from suppliers who have quality control programs in place and who stand behind their products.
- When purchasing commodities and/or by-products, ask for assurances that they do not contain contaminants (i.e., pesticides), which can cause meat residue problems.
- Maintain records of feed purchases to indicate source, date, and amount purchased for at least two years.

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To prevent the spread of diseases such as Johne's, wash tractor wheels and loaders after handling manure and before feeding cattle.



Be especially careful during years with drought, hail, or flood damage when grain crops are used as forages to feed to cattle.

## Feed Storage and Handling

- **Do not use** pesticide or insecticide containers to store feed or to feed cattle.
- **Do not store** crop chemicals, petroleum products, or other hazardous material in areas where feed is stored, mixed, or processed.
- **Do not allow** cattle access to areas where chemicals or other hazardous materials are stored.
- **Do not allow** moisture, rodents, and birds to contaminate the feed supply.
- **Do not contaminate** feeds with manure during feeding.

## Pesticide- and Petroleum-Based Products

To avoid residue problems in cattle, pesticides (both insecticides and herbicides) need to be used according to the directions on the label. These labels contain directions on the time that must elapse before the crop is harvested, as well as the crops and intended purpose of those crops (i.e., grazing, forage, or grain crop). Be especially careful during years with drought, hail, or flood damage when grain crops are used as forages to feed to cattle.

If feeds are purchased, ask if pesticides were used and at what time in the growing/harvesting season they were applied. A producer is responsible for making sure all feeds are of high quality and are residue-free.

- **Do not store** full or empty pesticide containers in areas accessible to cattle.
- **Do not store** pesticide containers where feed is stored, mixed, or fed.
- **Do not use** pesticide containers to store feeds or to feed cattle.
- **Do:** Routinely check equipment for leaks of hydraulic fluid.



Separate equipment for feeding and manure handling is the best management practice to prevent the spread of diseases.



The producer is responsible for knowing and complying with any changes to the regulations of the Ruminant Feed Ban as they are made.

## Ruminant Feed Ban Regulation

### Purpose and Scope

The U.S. Food and Drug Administration (FDA) adopted the “Animal Proteins Prohibited from Ruminant Feed” regulation to prevent the establishment of Bovine Spongiform Encephalopathy (BSE) in the United States through feed with the goal of minimizing any risk to animals and humans. The final rule went into effect on August 4, 1997.

The regulation establishes certain requirements for renderers, protein blenders, feed manufacturers, distributors (including haulers), and individuals and establishments that are responsible for feeding ruminant animals.

**The Ruminant Feed Ban regulation prohibits the use of proteins from ruminants in feeds intended for ruminant consumption.** There are, however, certain exceptions to the rule at this time, including:

- Pure porcine or pure equine protein
- Blood and blood by-products
- Gelatin
- Milk products (milk and milk protein)
- Inspected meat products that have been cooked and offered for human food and further heat processed for animal feed use

## Requirements for Producers Feeding Animal Proteins

This regulation applies to establishments, both large and small feeding operations, and to individuals who are responsible for feeding ruminants.

Producers are required to keep the following records for 24 months:

1. Copies of all purchase invoices for all feeds received that contain animal protein. If a feed intended for ruminants contains animal protein, the protein can consist only of nonprohibited material. The regulation requires maintenance of invoices for all feeds containing animal protein so that the FDA can verify, if necessary, that the animal protein contained in the ruminant feed is from nonprohibited sources.
2. Copies of labeling for feeds received, which contain permissible animal protein products. The agency recognizes that bulk shipments of feed are commonplace and that labeling information typically is contained in the invoices for bulk shipments. In those instances, maintenance of the invoice is sufficient.
  - If the only labeling for a bulk product is on a placard, the placard for each shipment should be retained.
  - Feed may also be received in bags or other containers that have attached labeling. In those instances, the labeling should be removed and retained. However, maintenance of only one such labeling piece is necessary from each shipment that represents a different product.
  - If the labeling cannot be removed from the bag or other container, maintenance of a representative bag or a transposed copy of the labeling information from a container that cannot feasibly be stored will suffice.

Records should be legible and easy to retrieve. Producers must make copies of both invoices and labeling available for inspection and copying by the FDA if audited.

## Requirements for Manufacturers Producing Feed with Animal Proteins

Following are the requirements for protein blenders, feed manufacturers, and distributors that separate prohibited material and nonprohibited material.

“Distributor” is defined as any firm or individual that distributes or transports feeds or feed ingredients intended for animals. Haulers are included in this definition. Haulers who haul both prohibited and nonprohibited material, including blended animal protein products, are subject to the same separation procedures as manufacturers. Haulers of complete and intermediate feeds are “distributors.”

All equipment, including that used for storage, processing, mixing, conveying, and distribution that comes in contact with feeds containing prohibited material and nonprohibited protein must use reasonable and effective procedures to prevent contamination of manufactured feed. The steps used to prevent contamination of feeds include one or more of the following or equally effective procedures:

- Physical means—vacuuming, sweeping, or flushing and/or sequential production of feeds.
- If flushing is utilized, FDA recommends that the flush material be properly identified, stored, and used in a manner to prevent contamination of other feeds. The volume of flushed material should be sufficient to equal the operating volume of the shared equipment.
- If sequential production is utilized, FDA recommends that it be on a predetermined basis designed to prevent unsafe contamination of ruminant feeds. An example of appropriate sequencing would be swine feed containing prohibited material, followed by a swine or poultry feed not using prohibited material, followed by a ruminant feed containing nonprohibited material.

For FDA Guidance Documents and Federal Register Notices, reference FDA's BSE homepage at <<http://www.fda.gov/cvm/bsetoc.html>>.



# Impact of Management Practices on Carcass Quality



**Sample records:**  
See Chapter 11.

**Carcass defects:** injection-site blemishes/lesions, bruises, dark cutters, liver condemnation, etc.

Improving quality and consistency begins with understanding the industry targets for carcass traits. As always, targets for carcass defects are zero.

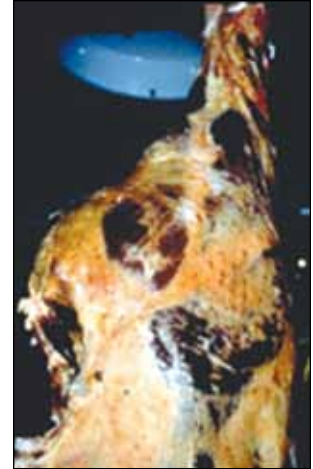
To improve quality and consistency, it is necessary to receive feedback on the performance of cattle that leave the production unit. Use this information as a basis for setting goals. By making adjustments, the consistency of meat products can be improved. Areas to evaluate include the rate of gain of cattle and feed conversion rate, and carcass grade.



Avoid standards and yield grades of 4 or 5.



Trait	Target
Yield Grade	< 3.0
Quality Grade	> Select, A-Maturity, No Dark Cutters
Carcass Weight	600 to 900 lb
Ribeye Area	11.0 to 15.0
Brands	No Hot Brands



## Importance of Genetics

Cutability, the percentage of boneless, closely trimmed retail cuts from a beef carcass, is reduced by both excessive external fat and inadequate muscling.

Muscling is more than a beef-quality issue; it is also a feedlot efficiency issue. Feeding practices that allow for the full expression of lean tissue (muscle) growth and development prior to finishing will also positively impact carcass cutability, even in lighter muscled cattle. Finally, muscle growth is energetically more efficient than fat accumulation, and this fact translates into better overall feed efficiency and a lower cost of gain in cattle with more muscle. Cow-calf producers must understand that their breeding and selection practices significantly impact muscling, as it is one of the most highly heritable genetic traits.

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## Reducing Bruising in Carcasses

Bruising costs the beef industry \$22 million annually in carcass trim at the time of processing. The most common cause of bruising is a hard bump against a protruding object or horns.

Rough, careless handling causes more than 50 percent of all bruises. It is advised not to rush livestock. Let them follow the leader and move at their own pace. Following are recommended practices to help reduce bruising:

### Horns

Horned cattle create bruises. Tipping of the horns will not reduce bruising. Polled cattle are recommended. Horned cattle need to be dehorned at an early age. Over-crowding horned cattle on a truck will increase bruising.

### Gates

Loin bruises are created when a gate is thrown into the side of an animal.

### Protruding Objects

Broken boards, nails, and exposed bolts should be eliminated. Check facilities by looking for shiny, rubbed spots or tufts of hair. Sliding gates (vertical or horizontal) should be padded with large-diameter hose. Corners can be padded by cutting strips from old tires or conveyor belts.

Carcasses with adequate muscling and without excess external fat are rewarded for quality—particularly when sold on a grade and yield basis.

## Fencing

Planks, sheet metal, or other fencing materials should be installed on the side of posts toward the cattle. If animals are being handled on both sides of the fence, install a rail to prevent cattle from catching hips on the posts. The area from 28 inches to 52 inches from the floor is the hazard zone.

## Flooring

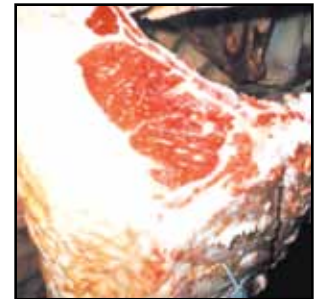
In new facilities with concrete floors where cattle are handled, prevent slipping and falling by scoring the concrete with an 8-inch diamond pattern with grooves 1 inch deep. In existing facilities, roughen the concrete or make a grid from 1-inch steel bars. Be sure to grind down sharp edges and let the concrete cure before permitting animal traffic.



Grooved concrete floors and scored rubber padding improve footing and comfort. This is most important for high traffic areas such as parlor holding pens and feedbunk alleys.

## Excessive External Fat

Excessive external fat costs producers \$50 per head of fed cattle marketed (2000 NBQA). Typically, the cost of this loss plus the carcass quality defects discussed in other sections of this BQA manual, are passed along to all producers because packers figure lost value into the prices paid for all cattle sold. In addition to average lost value to the market, excessive external fat creates less desirable yield grades, thus creating individual carcass discounts. Carcasses with adequate muscling and without excess external fat are rewarded for quality—particularly when sold on a grade and yield basis. National Beef Quality Audits indicated that beef quality improved with closely trimmed beef, heightened producer awareness of quality problems, improved cutability, and extended shelf-life or retail case-life of beef products. At the same time, the results of the audits show that more work remains to be done to improve eating quality and consistency.



Excessive external fat.

Beef cattle producers are encouraged to add disposition as a selection criteria.

## Dark Cutters

Dark-cutting beef carcasses (dark cutters) produce meat that is dark, firm, and dry, and result in significant economic losses in the United States. Dark cutters are caused by preharvest stress, which depletes muscle glycogen stores. Without sufficient glycogen in the carcass, lactic acid cannot be produced to reduce the pH of the meat. Weather, growth promotants, genetics, disposition, and handling practices before harvest all play a role in causing dark cutters.

## Feedlots

Mean percentages of dark cutters per pen differed between individual feed yards. This finding indicates that the incidence of dark cutters was in part due to different management philosophies or the structural attributes of the feed yards. The percentage of dark cutters may also be affected by when cattle are harvested during the week. Cattle that are “startup” cattle for the week can be expected to have more dark cutters because they may have more time to stand around than other sets of cattle brought in during the week.

## Implants

Data from Colorado State University indicate that cattle tend to have a lower incidence of dark cutters per pen when the time from reimplantation to harvest was longer than 100 days.

## Environment

The occurrence of dark-cutting beef is highest during very cold weather combined with precipitation. These conditions increase the rate of body-heat loss and elicit shivering, which depletes glycogen stores. The incidence of dark cutters is high in hot weather or when large fluctuations in temperature occur over short periods of time (i.e., when temperatures fluctuate more than 10 degrees in a 24-hour period).

## Mixing Different Groups of Cattle

Don't mix strange animals. Fighting to establish a new social order 24 to 48 hours prior to slaughter can increase the incidence of dark cutters. Bulls should be kept separate because mixing bulls with other cattle can cause dark cutters within 90 minutes.

## Crowding

Crowding can increase the incidence of dark cutters.

## Genetics

Temperament appears to be inherited. Producers are encouraged to add disposition as a selection criteria.

